

The Herpetology of Mt. Kinabalu, North Borneo, 13,455 ft.

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(Plates I and II and 3 text figures)

With an INTRODUCTION by F. N. CHASEN, C.M.Z.S.

INTRODUCTION

From the Government Station at Kota Belud in British North Borneo on the Tampassuk plain a bridle path follows the Tampassuk, or Kadamayan River through open country to the Dusun village of Kiau 3,000 ft., at the foot of Mt. Kinabalu.

In the vicinity of Kiau the country has been largely denuded of its original forest, but above the patches of native cultivation the forest is unbroken up to about 9,000 ft. Between 6,000 ft. and 9,000 ft. the forest assumes a mossy character, a carpet of thick, green moss covering ground and trees alike. Above 9,000 ft. the character of the vegetation changes yet once again. The jungle is lower and this "low-sheltered forest" continues up to the tree limit at about 10,500 ft. Above the tree limit are the bare slopes of the granite core.

The base camp was established at Kiau 3,000 ft. The ascent to the summit was by way of the main spur running into the mountain from the south: Tenompak 4,700', Lumu Lumu 5,500', Kamborangah 7,200', and Pakka 10,200' are points on this spur. After the return to Kiau, the mountain was explored from another direction and camps were established on the north-western slopes at 3,300 ft. in the Kenokok Valley and at 5,000 ft. on the subsidiary Marei Parei spur.

Miss L. S. Gibbs,¹ one of Kinabalu's botanical investigators, zones the mountain as follows:—

1. *The secondary forest*, 2,500 ft.—4,000 ft.
2. *The primary high forest*, 3,500 ft.—6,000 ft. on the main spur and to about 5,000 ft.—5,500 ft. on lower spurs and ridges, but reaching a much higher altitude in the more sheltered valleys. Where the population is scarce, as for instance around the base of the northern ridge, the primary forest extends to a much lower level.

¹. Journal of the Linnean Soc., Botany, XLII, 1914, p. 49.

3. *The mossy forest.* On some spurs of the mountain found as low as 5,000 ft. It is frequently not continuous, occurs as high as 9,000 ft. and on the Marei Parei spur loses itself on the granite core at 8,000 ft.

4. *The scrub formation.* Found only on the disintegrating serpentine of the exposed ridges, as for instance on the Marei Parei spur at 5,000 ft.—5,500 ft.

5. *The low sheltered forest.* 9,500 ft.—10,500 ft.

6. *The sub-summit dwarf forest.* | above 10,500 ft.
7. *The granite core.*

For the botanist this arrangement is perhaps more satisfactory than the broader divisions of Staph¹:—

1. *The hill zone*, from the littoral zone of the coast up to 3,000 ft.
2. *The lower mountain zone*, 3,000 ft.—6,000 ft.
3. *The upper mountain zone*, 6,000 ft.—10,500 ft.
4. *The summit zone*, 10,500 ft.—13,455 ft.

Without going into a great amount of detail concerning the distribution of some invertebrate groups it seems that the distribution of animals can be very conveniently expressed in terms of Staph's zones.

The area between Kinabalu and the sea is largely cultivated land or secondary forest, but the effect of the comparatively recent artificial clearing on animal life is as yet not profound. The original lowland fauna of the region still persists in the isolated patches of primary jungle, usually situated on the higher ground. There has been an infiltration of certain species through the cultivated tracts into areas they probably would not occupy under normal conditions.

To the zoologist, therefore, no fundamental difference exists between the first two divisions of both authors, the first division containing the relics of the fauna of the second. Our division of the mountain into faunal zones is therefore:—

1. *The lowland zone.* The primary forest up to 3,000 ft. The fauna is probably identical with that of any area of old forest at sea-level in North Borneo. In Borneo montane and sub-montane forms occur commonly at 3,500 ft., less commonly at 3,000 ft. and normally never below the latter altitude. The lowland fauna is almost excluded at 4,000 ft. but wandering individuals are found

¹ Trans. Linn. Soc. ser. 2, IV, 1894, pp. 69—263, pls. 11—20.

more commonly at higher altitudes than are stray examples of mountain species at low elevations. Animals are abundant in this zone:

2. *The mountain zone.* All the forest, high primary, mossy and low-sheltered up to the tree limit at about 10,500 ft. The mountain fauna may be said to commence at 3,000 ft. Most of its members are found throughout the whole zone, but it seems just possible to recognize two elements:—

(a) *The lower mountain zone.* From 3,000 ft. to 6,000 ft. The zone of the high forest in which lowland species occur sporadically. Certain species of a peculiar sub-montane habitat are also characteristic of this division. Animals are abundant.

(b) *The higher mountain zone.* From 6,000 ft. to 10,500 ft. The vegetation above the primary high forest up to the tree limit. Lowland forms are completely excluded; sub-montane forms are rare and some true montane species shun the higher levels of this zone. A few species are found more commonly than at lower levels.

Animal life is less abundant.

3. *The summit zone.* Above 10,500'. The sub-summit dwarf vegetation above the true tree-level and the exposed granite core.

Life is scarce and the occurrence of vertebrates is casual.

Any such division as that indicated above must of course be arbitrary in nature, especially when considered in relation to the mobile animal groups. It must always be modified if it is accurately to express the condition prevailing in any one group of animals.

The faunal zones are possibly best marked in certain groups of insects, fairly obvious in birds and mammals, but less appreciable in reptiles and batrachians.

The following is a list of the collecting stations and their characteristics:—

Kabayau. 600 ft. (The lowland zone).

The collections made here are really not germane to the present paper. They are from the jungle which, except for isolated patches, is of secondary growth, near the halting-bungalow on the bridle-path.

Koung. 1,300 ft. (The lowland zone).

A very pleasantly situated Dusun village with a halting-bungalow, on the bridle-path leading to the mountain.

The surrounding country is largely cultivated but there are small areas of old jungle on the neighbouring hill-tops and in the deep gullies.

Koung was used purely as a halting place but it yielded a few specimens.

Kiau. 3,000 ft. (The lower mountain zone).

A Dusun village at the foot of the mountain. Although there is no old forest near the village, Kiau is a good collecting ground and the prevailing secondary growth and thin lines of primary forest wisely left by the Dusuns on the ridges and steep slopes produce both mountain and lowland forms.

The base camp was established at Kiau and specimens were collected there before and after the two ascents of the mountain, and also by a collector permanently stationed in the village in charge of stores.

Batrachians (16), lizards (19) and snakes (19) very common at this level.

(The number in brackets indicates the number of species obtained).

Kenokok. 3,300 ft. (The lower mountain zone).

An excellent collecting ground situated in very high old forest. The camp was in the Kenokok valley on the right bank of the stream which eventually joins the Kinataki River. Ten species of batrachians were collected by the aid of a lamp after dark within one hundred yards of the camp.

Lizards and snakes less common than at the lower level of Kiau and its environs.

Lobang. 4,000 ft. (The lower mountain zone).

A large overhanging rock on the left bank of the Kadamayan River surrounded by heavy jungle. Until the new and less steep way up the mountain (*via* Dallas, (halting bungalow) Tenompok and Lumu Lumu) was discovered the Lobang Cave was usually used by travellers for the first night's camp after leaving Kiau.

Lobang was not visited by any of the party but the old route was always used by the Dusun coolies on their way to and from the various camps and a few specimens collected by them during their short rests at Lobang are included in the collection.

Tenompok. 4,700 ft. (The lower mountain zone).

A patch of heavy forest left among the secondary growth on the lower slope of the main spur. A few specimens were collected here during a halt on the ascent.

Marei Parei. 5,000 ft. (The lower mountain zone).

A subsidiary spur of the mountain reached by crossing the ridge north of Kiau, various streams and finally the Kinataki River.

The camp here was in very open country—the "scrub formation" of Miss Gibbs—but there was jungle, bamboo in its upper regions, close at hand below the camp. This bleak, exposed place was a poor collecting ground for batrachians and reptiles.

Lumu Lumu. 5,500 ft. (The lower mountain zone).

The camp was in dense forest, tall but very mossy, on the main spur of the mountain.

A good collecting ground for frogs, but lizards and snakes scarce.

Kamborangah. 7,200 ft. (The higher mountain zone).

A ridge on the main spur of the mountain. The camp was in mossy forest but this was lower and more scrubby than at Lumu Lumu.

From this camp *Natrix murudensis* was collected at 8,000 ft., the highest point at which a reptile was obtained. Only two snakes, both of the same species, were collected.

Pakka. 10,200 ft. (The higher mountain and summit zones).

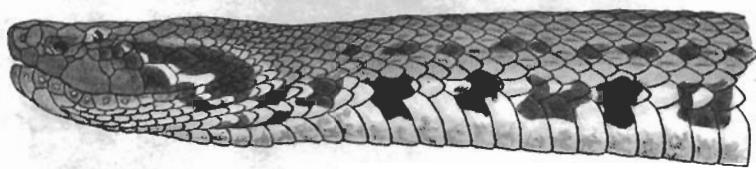
The highest camp, made in a small cave formed by a large overhanging rock on the left bank of the Kadamayan River. From this camp the summit 13,455 ft. was visited once and the tree-limit on many occasions.

Collecting was carried out above the camp in the upper regions of the low mossy forest, in the low sheltered forest of the tree-limit and on the granite core above this. No batrachian recorded from above 10,300 ft. where only *Nectophryne altitudinis* was secured.

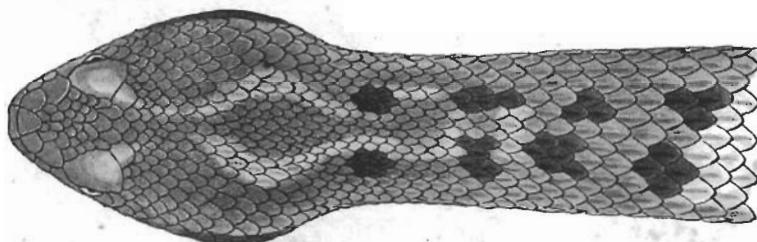
The three species of batrachians obtained were not conspicuously common and "frogging" with the lamp after dark was always unsuccessful. F. N. C.



1. *Nectophryne altitudinis* M. A. Smith.
2. *Philautus spiculosus* M. A. Smith.
3. *Philautus amoenus* M. A. Smith.
4. *Leptobrachella baluensis* M. A. Smith.



1.



2.



W.P.C. Tension del.

John Bale, Sons & Danielson, Ltd, London.

1. *Trimeresurus chaseni* M. A. Smith.
2. *Jalapura ornata* Lidth de Jeude.